FIG. 1

HIERARCHICAL ROUTING IN OSPF
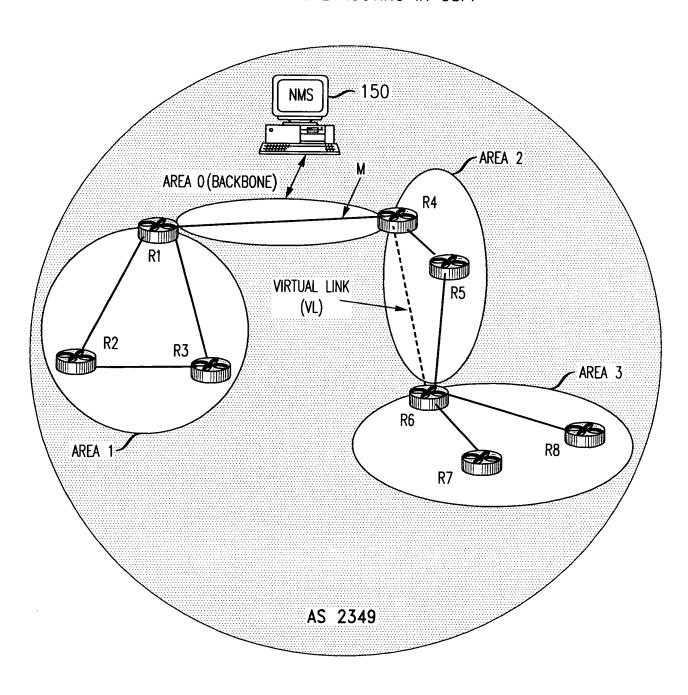
FIG. 2

AUTOMATIC DETECTION AND AUTOMATIC CONFIGURATION OF VIRTUAL
LINKS: NO INTERFACE IS OSPF ENABLED, MINIMAL CONFIGURATION.

START — 201

WILL NEW ROUTER R BE ABR ? — 203
YES
NO → STOP — 205

WILL ROUTER R HAVE AN OSPF INTERFACE PHYSICALLY CONNECTED TO OSPF BACKBONE ? — 207
NO
YES → STOP — 209

$n = 1$ — 211

$n{+}{+}$ — 219

DOES AREA A_n OF OSPF INTERFACE I_n HAVE A BACKBONE CONNECTIVITY ? — 213
NO
YES

STOP — 217
YES ← $n > nmax?$ — 215
NO

IS IT POSSIBLE TO CONFIGURE VL ON NEW ROUTER R ? — 221
YES
NO

CONFIGURE VL ON NEW ROUTER R — 223

IS IT POSSIBLE TO CONFIGURE VL ON OSPF NEIGHBOR ROUTER OF INTERFACE I_n — 227
YES
NO

225 — STOP

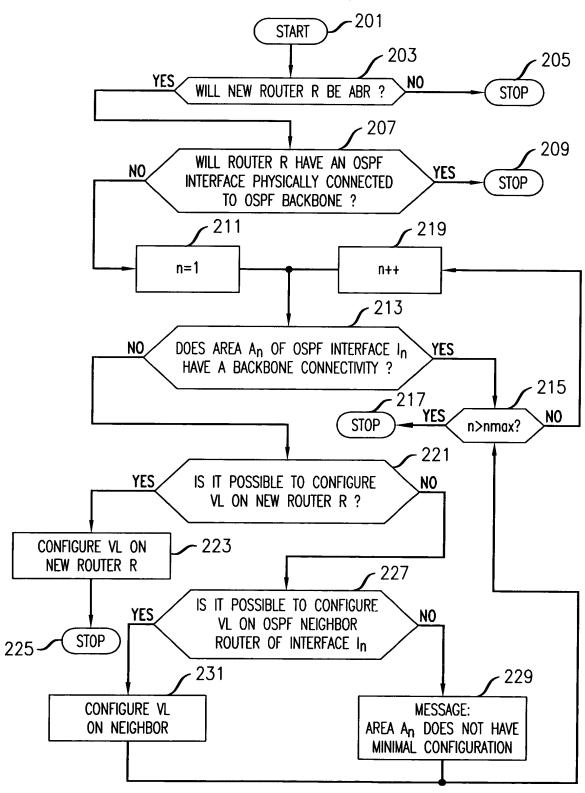CONFIGURE VL ON NEIGHBOR — 231

MESSAGE: AREA A_n DOES NOT HAVE MINIMAL CONFIGURATION — 229

FIG. 3

AUTO DETECTION AND AUTOMATIC CONFIGURATION OF VIRTUAL LINKS: NO
INTERFACE IS OSPF ENABLED, COMPLETE CONFIGURATION.

START — 301

WILL NEW ROUTER R BE ABR ? — 303
YES   NO

WILL ROUTER R HAVE AN OSPF INTERFACE
PHYSICALLY CONNECTED TO OSPF BACKBONE ? — 305
NO   YES

IS IT POSSIBLE TO CONFIGURE VL ON NEW
ROUTER R THROUGH ANY AREA A_n (n=1...nmax) ? — 307
YES   NO

CONFIGURE VL ON NEW ROUTER
R THROUGH AREA A_n — 309

311 — n=o

n>nmax? — 331   STOP — 333
NO   YES

n++ — 329

IS OSPF NEIGHBOR
ROUTER r OF INTERFACE
I_n IN AREA A_n ABR ? — 313
YES   NO

315
IS NEIGHBOR
ROUTER r CONNECTED
TO OSPF BACKBONE ?
YES   NO

DOES AREA A_n
HAVE BACKBONE
CONNECTION ? — 321
YES   NO

IS IT POSSIBLE TO
CONFIGURE VL ON
NEIGHBOR ROUTER ?
YES   NO
317

ARE ALL ABRs IN
AREA A_n CONNECTED
TO BACKBONE ? — 323
NO   YES

CONFIGURE VL
ON NEIGHBOR
319

CONVEY ERROR: COMPLETE
CONFIGURATION IS NOT POSSIBLE
BUT AT LEAST MINIMAL
CONFIGURATION DONE FOR AREA A_n. — 325

CONVEY ERROR: NOT EVEN
MINIMAL CONFIGURATION
FOR AREA A_n IS POSSIBLE — 327

FIG. 4
RECONFIGURATION OF VIRTUAL LINKS: MINIMAL CONFIGURATION.

START —401

403— n=1

NO n>n_{max}? YES → STOP 413 411

405
DOES AREA A_n HAVE AT LEAST ONE ABR CONNECTED TO BACKBONE ?
NO   YES

409— n++

415
MESSAGE: AREA A_n DOES NOT HAVE EVEN MINIMAL CONFIGURATION

407
MESSAGE: AREA A_n ALREADY HAVE AT LEAST MINIMAL CONFIGURATION

417— j=1

NO j>j_{max}? YES 423

425
MESSAGE: AREA A_n CANNOT BE CONFIGURED FOR MINIMAL CONFIGURATION

419
IS IT POSSIBLE TO CONFIGURE VL ON ABR R_{nj} ?
YES   NO → j++ —421

427
CONFIGURE VL ON ABR R_{nj}

429
MESSAGE: AREA A_n IS CONFIGURED FOR MINIMAL CONFIGURATION

FIG. 5

RECONFIGURATION OF VIRTUAL LINKS: COMPLETE CONFIGURATION.

START — 501

503 — $n=1$

527 — $n>nmax?$ — NO / YES

529 — STOP

525 — $n++$

505 — $j=1$ $k_n=0$

513 — $j>j_{max}?$ — NO / YES

521 — $k_n=j-1?$ — NO / YES

507 — IS ABR R_{nj} IN AREA A_n CONNECTED TO BACKBONE ? — NO / YES

509 — k_n++

523 — MESSAGE: AT LEAST COMPLETE CONFIGURATION EXISTS FOR AREA A_n

515 — IS IT POSSIBLE TO CONFIGURE VL ON ABR R_{nj} ? — NO / YES

511 — $j++$

531 — $k_n=0?$ — YES / NO

517 — MESSAGE: COMPLETE CONFIGURATION IN AREA A_n IS NOT POSSIBLE BECAUSE VL CANNOT BE CREATED ON ABR R_{nj}

519 — CONFIGURE VL ON ABR R_{nj}; k_n++

533 — MESSAGE: EVEN MINIMUM CONFIGURATION DOES NOT EXISTS FOR AREA A_n

535 — MESSAGE: AT LEAST MINIMUM CONFIGURATION EXISTS FOR AREA A_n